

## PubMed search results: 'cellulite' (April 22, 2009)

Courtesy of Dr. Dennis Clark, Ph.D., [BellyFatScience.com](http://BellyFatScience.com)

1: Int J Dermatol. 2009 Mar;48(3):265-70.

Treatment of cellulite with LPG endermologie.

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**BACKGROUND:** LPG endermologie is a FDA-approved massage system in use worldwide for cellulite treatment that lacks clinical study. **OBJECTIVE:** To determine the efficacy and safety of LPG endermologie in treating cellulite. **METHODS:** Thirty-three healthy women (cellulite grades, 1-3 based on the 4-stage Nurnberger-Muller scale) had LPG treatments twice weekly for a total of 15 sessions. Clinical evaluation was performed by digital photography for cellulite grade assessment, and perimetric measurements of eight body sites for the evaluation of body contours. **RESULTS:** Significant differences were found regarding mean cellulite grades before and after treatment. However, improved cellulite appearance occurred in only 5 women (15%). All patients showed a significant circumference loss at every measured body site. Weight losers had significantly greater loss of total and average body circumference than weight gainers. **Limitations** Relatively small sample size and lack of more-objective methods for assessing treatment success. **CONCLUSION:** LPG endermologie is a well-tolerated and effective method for reducing the diameter of body circumference, however, it is mildly effective in reducing the cellulite grade and so, improving its orange-peel appearance.

PMID: 19261014 [PubMed - in process]

2: J Cosmet Laser Ther. 2008 Dec;10(4):202-9.

Reduction of subcutaneous fat and improvement in cellulite appearance by dual-wavelength, low-level laser energy combined with vacuum and massage.

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**BACKGROUND:** This study compares the efficacy and safety of low-level, dual-wavelength laser energy and massage with massage alone for the reduction of subcutaneous fat in the thighs of normal women. The device was an early prototype of the FDA-cleared SmoothShapes system (Elemé Medical, Merrimack, NH, USA). **METHODS:** The thighs of each individual (n=102) were randomized to either laser light (dual wavelength of 650+/-20 nm and 915+/-10 nm) and massage or to massage alone (control). Individuals who completed the study (n=74) received a mean of 14.3 treatments over 4-6 weeks. Magnetic resonance imaging (MRI) scans quantified fat pad dimensions before and after the final treatment. **RESULTS:** Fat thickness decreased for the leg treated with laser-massage by 1.19 cm(2) (mean) and increased by 3.82 cm(2) (mean) for the control leg over time. The difference was statistically significant (p<0.001). Among those who completed the study, 82.26% responded to treatment. Individuals reported looser-fitting clothing and satisfaction with the procedure and results. Adverse effects were limited to occasional increases in urinary frequency. **CONCLUSION:** Low-level, dual-beam laser energy with massage appears to be safe and more efficacious than massage alone for reducing subcutaneous fat in the thighs of normal women.

Publication Types:  
Clinical Trial

PMID: 19093288 [PubMed - indexed for MEDLINE]

3: J Cosmet Laser Ther. 2008 Dec;10(4):193-201.

Effects of cellulite treatment with RF, IR light, mechanical massage and suction treating one buttock with the contralateral as a control.

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**BACKGROUND AND OBJECTIVES:** A system that combines bipolar radio frequency (RF) and intense infrared light (IR) together with mechanical massage and suction has recently been reported as being efficient for cellulite treatment. The present split study was designed to evaluate the efficacy of such a system through various treatments of cellulite located on the buttocks. **METHODS:** Ten patients were enrolled for 12 sessions of 30 minutes each performed over one buttock, the other buttock serving as an untreated control. Sessions were conducted twice a week for a period of 12 weeks. Clinical photography and profilometry were carried out to assess textural changes before (baseline) and 2 months after the final treatment. Histopathology was performed at baseline, 2 hours after the first session, and just before the 12th session and 2 months thereafter. **RESULTS:** All patients noted improvement in the treated buttock before the final session, which was maintained at the 2-month assessment. Improved skin appearance was noticed after the first session and was maintained throughout the study. All patients were satisfied with the results and requested further treatment in order to balance the results in both buttocks. Random histological analyses suggested dermal firmness, fibre compaction and tightening of skin layers, including the subcutis, as possible reasons for the effects achieved. The authors recognize that the small number of participants limits the statistical power of the study. **CONCLUSIONS:** Treatment sessions with the combined RF, IR light and mechanical massage and suction system were complication free, produced improvements in the overall cellulite appearance and skin condition, suggesting that further treatment sessions for maintenance could sustain patient satisfaction index (SI) and lead to lasting results. Based on the good results in the limited trial population, further studies with larger patient populations are warranted.

Publication Types:

Clinical Trial

Research Support, Non-U.S. Gov't

PMID: 18991154 [PubMed - indexed for MEDLINE]

4: J Eur Acad Dermatol Venereol. 2008 Dec;22(12):1465-70. Epub 2008 Aug 28.

Use of the microdialysis technique to assess lipolytic responsiveness of femoral adipose tissue after 12 sessions of mechanical massage technique.

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**BACKGROUND:** Adipocytes in femoral areas are known to be metabolically 'silent'. Changes related to fat cell hypertrophy may be involved in the formation of cellulite. A mechanical massage technique, with circulatory and dermatrophic properties, has been shown to have an impact on clinical evaluations (i.e. changes in morphometric measurements) in cellulite areas. Whether this technique affected lipolytic responsiveness in subcutaneous adipose tissue of cellulite areas was not known. **OBJECTIVE:** Using a microdialysis technique in subcutaneous adipose tissue, a study was carried out to test the in situ incidence of a mechanical massage technique in terms of adipose tissue responsiveness to a

lipolytic challenge. MATERIALS AND METHODS: Nine healthy women volunteers with cellulite (grade > or = 2) were included and treated with 12 sessions of mechanical massage technique (Endermologie). Microdialysis has been carried out in the femoral adipose tissue in order to assess lipolytic responsiveness via glycerol determination following perfusion of a lipolytic agent (0.1, 1 and 10 microm isoproterenol). Clinical evaluations (measurements of waist, thighs and skin fold) were carried out in parallel. All evaluations were performed before and after treatment. RESULTS: The studied intervention lowered resting dialysate glycerol levels in femoral adipose tissue. The lipid-mobilizing effect of isoproterenol was enhanced after 1 month of treatment. In addition, a clear decrease of morphometric measurements (mean decrease on thighs perimeter: 3.1 to 3.3 cm, P < 0.01) was observed. CONCLUSION: These results suggest an increase in the lipolytic responsiveness of femoral adipose tissue in women with cellulite having undergone 12 sessions of mechanical massage.

Publication Types:

Research Support, Non-U.S. Gov't

PMID: 18761545 [PubMed - indexed for MEDLINE]

5: Dermatol Clin. 2008 Jul;26(3):341-58, v.

Procedures offered in the medical spa environment.

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Medical spas' menus of services vary widely and depend greatly on the medical director or owner's experience and predilection. Core services include: microdermabrasion, mild chemical peels, medical facials, laser hair removal, photorejuvenation, botulinum toxin, and injectable fillers. Common procedures include cellulite reduction, tissue tightening, and acne treatments. Less common procedures that are more likely to be performed in medical spas with direct on-site daily involvement of the medical director include: laser resurfacing, laser-assisted lipoplasty, sclerotherapy, photodynamic therapy, and cosmetic surgery. Multisite spas often use multi-platform devices to assist with uniformity in menu offerings and training.

Publication Types:

Review

PMID: 18555951 [PubMed - indexed for MEDLINE]

6: Int J Cosmet Sci. 2006 Jun;28(3):175-90.

Cellulite and its treatment.

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The presence of cellulite is an aesthetically unacceptable cosmetic problem for most post-adolescent women. It is largely observed in the gluteal-femoral regions with its 'orange-peel' or 'cottage cheese' appearance. It is not specific to overweight women although increased adipogenicity will exacerbate the condition. It is a complex problem involving the microcirculatory system and lymphatics, the extracellular matrix and the presence of excess subcutaneous fat that bulges into the dermis. It has been described as a normal condition that maximizes subcutaneous fat retention to ensure adequate caloric availability for pregnancy and lactation. Differences in the fibrous septae architecture that compartmentalize the adipose tissue have recently been reported in women with

cellulite compared with men. Weight loss has been reported to improve the cellulite severity by surface topography measures although in obese subject's skin dimpling does not seem to change appreciably. However, histological analysis suggests that fat globules retract out of the dermis with weight loss. Cellulite has been treated with massage which decreases tissue oedema but it is also likely to have its effects at the cellular level by stimulating fibroblast (and keratinocyte) activity while decreasing adipocyte activity. In addition to massage, effective topical creams with a variety of agents were used to ameliorate the condition. Nevertheless, only a few studies are reported in the scientific literature. Xanthines, botanicals, fragrances and ligands for the retinoid and peroxisomal proliferator-activated receptors appear to be giving some benefit. Reducing adipogenesis and increasing thermogenesis appear to be primary routes and also improving the microcirculation and collagen synthesis. Many agents are being investigated for weight management in the supplement industry [hydroxycitrate, epigallocatechin gallate, conjugated linoleic acid (CLA), etc.] and some of these agents seem to be beneficial for the treatment of cellulite. In fact, CLA was proven to ameliorate the signs of cellulite. One product, Cellasene, containing a variety of botanicals and polyunsaturated fatty acids also appears to provide some relief from these symptoms. Although more work is needed, clearly these treatments do improve the appearance of skin in subjects with cellulite. It is quite possible, however, that synergies between both oral and topical routes may be the best intervention to ameliorate the signs and symptoms of cellulite.

PMID: 18489274 [PubMed - in process]

7: J Drugs Dermatol. 2008 Apr;7(4):341-5.

An evidence-based assessment of treatments for cellulite.

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Cellulite, a skin surface change that is nearly ubiquitous in women, is a condition that remains elusive to treatment. In fact, no treatment is completely successful as none are more than mildly and temporarily effective. Despite the lack of evidence to support efficacy, treatment options continue to proliferate. This article will briefly review the currently available data about cellulite treatments including noninvasive devices such as massage, radiofrequency, and laser and light-based treatments; invasive modalities including liposuction, mesotherapy, and subcision; and other treatments including topical creams and carboxy therapy.

Publication Types:  
Review

PMID: 18459514 [PubMed - indexed for MEDLINE]

8: J Drugs Dermatol. 2008 Feb;7(2):113-5.

Reductions in thigh and infraumbilical circumference following treatment with a novel device combining ultrasound, suction, and massage.

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Liposuction is the gold standard of body contouring procedures. Many patients, however, will not tolerate the invasiveness and subsequent recovery time associated with this procedure, despite the likelihood of superior results. Consequently, patients opt for minimally invasive forms of body contouring that

require several treatments, have fewer associated side effects, and afford more modest improvements. The MedSculpt device is one such modality that combines computerized massage, vacuum suction, and ultrasound with a continuous sinusoidal pulse delivered at a frequency of 3 Hz. The efficacy of this device was assessed in the reduction of thigh and abdominal circumferences. Five patients were included in this pilot study. A total of 12 treatments were performed on a semiweekly basis to 2 abdomens and 3 pairs of thighs. Photographs and circumferential measurements of each area were obtained prior to, and at the conclusion of, the treatment course. The treatments were well tolerated and without side effects. The mean reduction in thigh circumference was 2.25 cm or 4%, with a 5 cm reduction in 1 subject. Although limited improvement was seen in supraumbilical circumference, the mean reduction in infraumbilical circumference was 6.5 cm or 7.3%, with a 10 cm reduction in 1 subject. Mild improvement in skin tone, texture, and the appearance of cellulite was observed in all study participants. The results observed after 12 treatments were similar to or better than those seen with other minimally invasive, body contouring devices.

Publication Types:

Clinical Trial

Research Support, Non-U.S. Gov't

PMID: 18335646 [PubMed - indexed for MEDLINE]

9: J Plast Reconstr Aesthet Surg. 2008 Nov;61(11):1321-4. Epub 2007 Oct 22.

An evaluation of mesotherapy solutions for inducing lipolysis and treating cellulite.

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The aim of this study was to evaluate the lipolytic potential of solutions used in the practice of cosmetic mesotherapy to stimulate lipolysis, cause local fat reduction and reduce the appearance of cellulite. The mesotherapy solutions were tested in a human fat cell assay using the fold induction of glycerol generation as a measure of lipolysis. The following mesotherapy solutions were tested: aminophylline; yohimbine; isoproterenol; melilotus; aminophylline with melilotus; aminophylline with isoproterenol; aminophylline with isoproterenol and yohimbine; aminophylline with isoproterenol and lidocaine; and aminophylline with isoproterenol, yohimbine and lidocaine. Isoproterenol ( $P < 0.002$ ), aminophylline ( $P < 0.00004$ ) and yohimbine ( $P < 0.001$ ) stimulated lipolysis compared to the buffer control. The lipolysis stimulated by melilotus ( $P < 0.01$ ) and isoproterenol ( $P < 0.002$ ) was enhanced by aminophylline ( $P < 0.001$  and  $P < 0.001$ , respectively). The lipolytic stimulation by aminophylline and isoproterenol ( $P < 0.0009$ ), and by aminophylline and isoproterenol with yohimbine ( $P < 0.0007$ ) was inhibited by lidocaine, not significant compared to buffer control for aminophylline and isoproterenol, but aminophylline, isoproterenol and yohimbine still stimulated lipolysis more than control, ( $P < 0.05$ ). Isoproterenol, aminophylline, yohimbine and melilotus stimulate lipolysis alone, and lipolysis is further enhanced by combining lipolytic stimulators in mesotherapy solutions. Lidocaine is antilipolytic and should be removed from mesotherapy solutions designed for local fat reduction.

Publication Types:

Research Support, Non-U.S. Gov't

PMID: 17954040 [PubMed - indexed for MEDLINE]

10: J Nutr Sci Vitaminol (Tokyo). 2007 Apr;53(2):133-7.

Effects of dietary *Angelica keiskei* on serum and liver lipid profiles, and body

fat accumulations in rats.

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*Angelica keiskei* (Ashitaba) is a perennial plant belonging to the Umbelliferae family. Recently, much attention has been focused on Ashitaba products as a so-called health food for the breakdown of cellulite among various physiological benefits of Ashitaba. The current study was carried out to investigate the physiological efficacy of dietary Ashitaba on serum and liver lipid profiles and body fat accumulation in rats. Rats were fed a high-fat diet with various amounts of Ashitaba for 28 d. Perirenal adipose tissue weights of rats fed the x 10 (170 mg/100 g BW) Ashitaba diet were significantly higher ( $p < 0.05$ ) than those of the control group. Serum triacylglycerol concentrations of rats fed the x 100 (1,700 mg/100 g BW) Ashitaba diet were significantly higher ( $p < 0.05$ ) than those of the x 1 (17 mg/100 g BW) group. Fecal weights and bile acid excretions of rats fed the x 10 or x 100 Ashitaba diet were significantly higher ( $p < 0.05$ ) than those of the control group. However, there were no significant differences in the body weight gain, epididymal adipose tissue weight, serum cholesterol or liver lipid concentrations or other biochemical profiles in the serum. Furthermore, even the excessive ingestion of Ashitaba had no significant pathological impact on the liver or kidney. These results indicate that the large intake of Ashitaba products may supply dietary fiber and thus improve gastrointestinal condition through the increased excretion of feces containing high level of bile acids, although even excessive intake of Ashitaba for a short period of 28 d did not show any impact on the decrease in body fat or modification of lipid profiles in this study.

PMID: 17616000 [PubMed - indexed for MEDLINE]

11: J Cosmet Laser Ther. 2007 Mar;9(1):15-20.

A study evaluating the safety and efficacy of the VelaSmooth system in the treatment of cellulite.

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**BACKGROUND:** Most cellulite treatments are limited in their effectiveness. A combination of radiofrequency energy, infrared light and mechanical manipulation of the skin and fat merits further examination. **OBJECTIVE:** Subjects were treated with a device combining these energies to evaluate its safety and efficacy. **METHODS:** Sixteen subjects with cellulite were treated twice weekly for 6 weeks with the VelaSmooth system. One thigh was treated while the other served as a control. Treatment efficacy was measured through circumferential measurements of both thighs and by having the investigator and an independent evaluator grade visual improvement during follow-up visits. Five patients provided blood specimens for assessment of lipid and hormone levels and liver function. Two subjects provided three biopsies each in order to monitor the level of estrogen and progesterone receptors. **RESULTS:** The overall thigh circumference decreased in 71.87% of the treated legs. The mean decrease was 0.44 cm of the lower thigh and 0.53 cm of the upper thigh. There was significant visual improvement in cellulite and skin texture. At the final follow-up visit, 50% of subjects had greater than 25% improvement (good to very good). **CONCLUSION:** This study showed positive results. Future studies employing higher energy levels and additional treatments will likely augment the results of the present study.

Publication Types:

Controlled Clinical Trial  
Multicenter Study  
Research Support, Non-U.S. Gov't

PMID: 17506136 [PubMed - indexed for MEDLINE]

12: Lasers Surg Med. 2006 Dec;38(10):908-12.

A single center, randomized, comparative, prospective clinical study to determine the efficacy of the VelaSmooth system versus the Triactive system for the treatment of cellulite.

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**BACKGROUND AND OBJECTIVES:** One area of cosmetic concern for women of all races is the unsightly appearance of cellulite in the buttocks area and lower extremities. Two modern technological advances claim to improve cellulite and provide reproducible results, TriActive and VelaSmooth. The TriActive laser is intended to reduce the appearance of cellulite through the combination of low-energy diode laser, contact cooling, suction, and massage. The VelaSmooth is based on a combination of two different ranges of electromagnetic energy: infrared light and radio frequency (RF) combined with mechanical manipulation of the skin. This single center study was designed to evaluate the efficacy of the VelaSmooth versus TriActive in the reduction of the appearance of cellulite. **STUDY DESIGN/MATERIALS AND METHODS:** Twenty female patients were treated twice a week for 6 weeks with the randomization of TriActive on one side and VelaSmooth on the other side. Patients were evaluated with photographs and circumferential thigh measurements before treatment and after the final treatment. **RESULTS:** Although there was improvement in the reduction of cellulite for each device individually, there was no significant difference between VelaSmooth or TriActive devices in the following categories: reduction of thigh circumference, photographic evaluation, and perceived change in before and after photographic grading. There was a statistically significant increase in the incidence of post-treatment bruising with the VelaSmooth compared to TriActive. **CONCLUSIONS:** In conclusion, both the TriActive and VelaSmooth provide improvement of cellulite. When comparing differences in efficacy, the average mean percent change calculated was roughly the same for both treatments and showed no statistical difference. (c) 2006 Wiley-Liss, Inc.

Publication Types:

Comparative Study  
Randomized Controlled Trial  
Research Support, Non-U.S. Gov't

PMID: 17163477 [PubMed - indexed for MEDLINE]

13: Dermatol Surg. 2006 Apr;32(4):465-80.

Mesotherapy and phosphatidylcholine injections: historical clarification and review.

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**BACKGROUND:** Mesotherapy was originally conceived in Europe as a method of utilizing cutaneous injections containing a mixture of compounds for the treatment of local medical and cosmetic conditions. Although mesotherapy was traditionally employed for pain relief, its cosmetic applications, particularly

fat and cellulite removal, have recently received attention in the United States. Another treatment for localized fat reduction, which was popularized in Brazil and uses injections of phosphatidylcholine, has been erroneously considered synonymous with mesotherapy. Despite their attraction as purported "fat-dissolving" injections, the safety and efficacy of these novel cosmetic treatments remain ambiguous to most patients and physicians. OBJECTIVE: To distinguish mesotherapy from phosphatidylcholine injections by reviewing their history and the relevant experimental or clinical findings. METHODS: A comprehensive search of Medline indexed literature and conference proceedings. RESULTS: All the published studies evaluating the clinical efficacy of traditional mesotherapy currently originate from Europe. These reports focus primarily on musculoskeletal pain and vascular disease, rather than cosmetic applications. Although experimental data suggest that a number of traditional mesotherapy ingredients may theoretically reduce fat, these effects have not been supported in peer-reviewed studies. An increasing number of reports demonstrate that subcutaneous injections of a formula containing phosphatidylcholine combined with its emulsifier, deoxycholate, are effective in removing small collections of adipose tissue. Cell lysis, resulting from the detergent action of deoxycholate, may account for this clinical effect. CONCLUSIONS: Mesotherapy is distinct from a method of treating adipose tissue with subcutaneous injections of deoxycholate alone or in combination with phosphatidylcholine. Additional clinical and experimental studies are necessary to more definitively establish the safety and efficacy of these treatments.

Publication Types:  
Review

PMID: 16681654 [PubMed - indexed for MEDLINE]

14: J Cosmet Laser Ther. 2005 Jun;7(2):81-5.

Cellulite treatment using a novel combination radiofrequency, infrared light, and mechanical tissue manipulation device.

Alster TS, Tanzi EL.

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BACKGROUND: Most post-pubertal women exhibit cellulite, particularly in the thigh and buttock regions. The prevalence of cellulite has led to many attempts at treatment, including a variety of topical solutions, massage-based therapies, and surgical techniques--most with suboptimal clinical effects. The purpose of this controlled study was to evaluate a novel combination device involving radiofrequency, infrared light, and mechanical tissue manipulation for the treatment of cellulite. METHODS: Twenty adult women (ages 25-57 years) of various skin phototypes (I-V), and with moderate bilateral thigh and buttock cellulite, received eight biweekly treatments to a randomly selected side (the contralateral side serving as a non-treated control). A combined bipolar radiofrequency, infrared light, and mechanical suction-based massage device was applied at 20 watts RF, 20 watts IR (700-1500 nm) light, and 200 millibar vacuum (750 mmHg negative pressure). Patients were evaluated using standardized digital photography and circumferential leg measurements at baseline, prior to each treatment session, and at one, three, and six months after the final treatment. Clinical improvement scores of comparable photographs using a quartile grading scale (0 = or < 25%, 1 = 25%-50%, 2 = 51%-75%, 3 = or >75% improvement) were made independently by two masked medical assessors after the series of treatments. Final post-treatment body weight and patients' subjective evaluations were recorded. RESULTS: Ninety per cent (18/20) of patients noticed overall clinical improvement, and 17 of these 18 patients reported that they would pursue treatment of the contralateral thigh. Side effects were limited to transient erythema in most patients, and bruising was observed in 2/20 patients after the first couple of treatment sessions, but not as the treatment series progressed. Clinical improvement scores averaged 1.82 (corresponding to approximately 50%

improvement) after the series of treatments. Circumferential thigh measurements were reduced by 0.8 cm on the treatment side. CONCLUSIONS: Cellulite can be significantly and safely reduced with the use of a noninvasive device that combines bipolar RF, infrared light, and mechanical massage. The effects of treatment appear to be prolonged, but maintenance treatments may be necessary to further enhance the clinical results achieved.

Publication Types:

Controlled Clinical Trial

PMID: 16537213 [PubMed - indexed for MEDLINE]

15: Biofactors. 2005;24(1-4):275-82.

Anti-fibrosclerotic effects of shock wave therapy in lipedema and cellulite.

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In vivo measurements in 26 female patients with lipedema and cellulite parameters were carried out before and after therapy by means of complex physical decongestive therapy (CPDT) including manual lymph drainage and compression as main components and/or shock wave therapy (SWT). Oxidative stress parameters of blood serum and biomechanic skin properties/smoothing of dermis and hypodermis surface were evaluated. Oxidative stress in lipedema and cellulite was demonstrated by increased serum concentrations of malondialdehyde (MDA) and plasma protein carbonyls compared with healthy control persons. Both MDA and protein carbonyls in blood plasma decreased after serial shock wave application and CPDT. The SWT itself and CPDT itself lead to MDA release from edematous tissue into the plasma. Obviously both therapy types, SWT and CPDT, mitigate oxidative stress in lipedema and cellulite. In parallel SWT improved significantly the biomechanic skin properties leading to smoothing of dermis and hypodermis surface. Significant correlation between MDA depletion of edematous and lipid enriched dermis and improvement of mechanic skin properties was demonstrated. From these findings it is concluded, that a release of lipid peroxidation (LPO) products from edematous dermis is an important sclerosis-preventing effect of SWT and/or CPDT in lipedema and cellulite. Expression of factors stimulating angiogenesis and lymphangiogenesis such as VEGF was not induced by SWT and/or CPDT and, therefore, not involved in beneficial effects by SWT and/or CPDT.

PMID: 16403988 [PubMed - indexed for MEDLINE]

16: Dermatol Surg. 2005 Jul;31(7 Pt 2):866-72; discussion 872.

Botanical extracts used in the treatment of cellulite.

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BACKGROUND: Cellulite is defined as skin relief alterations that give the skin an orange peel or mattress appearance. The lesions tend to be asymptomatic and may be considered the anatomic expressions of the structures in the affected area, such as the fat and subcutaneous septa. OBJECTIVE: The present article reviews the most important botanical extracts used as active ingredients in the treatment of cellulite, as well as the steps to obtain these botanicals as raw material and their standardization and quality control, which are important to guarantee their therapeutic action. METHODS: The current literature was reviewed, and we also obtained information from the manufacturers of the products that contained botanicals because of the few publications about this subject. CONCLUSIONS: The

reduction in fat deposits through the continuous use of anticellulite products depends on the availability of the active ingredient at the action site, the concentration of the ingredient in the formulation, and the physiochemical characteristics particular to each active ingredient. The botanicals used in topical products must have standardized extracts, which would permit each phytomedicine to have the same effect anywhere in the world. New scientific research is necessary to verify the efficacy and ideal concentrations of such substances.

Publication Types:  
Review

PMID: 16029680 [PubMed - indexed for MEDLINE]

17: Clin Dermatol. 2003 Nov-Dec;21(6):473-5.

Psychosocial aspects of beauty: how and why to look good.

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It is difficult to pick up a paper or magazine today or turn on the television without being reminded that ours is a culture of youth and beauty. Bookstore shelves sag under the weight of enticing tomes devoted to the subject. We are bombarded with advertisements for any one of thousands of different products, both prescription and over-the-counter, that claim to be able to restore our youthful appearance, banish wrinkles, tone skin, and remove cellulite, among other promises that often sound, and probably are, too good to be true. Health food stores and sales catalogs are replete with myriad products, so that one wonders how the average person, in face of such bombardment, can either resist the temptation to buy or make an informed selection from the veritable feast of goodies put before them. Billions of dollars are expended each year, and false claims abound, but fortunately, there are many preparations and procedures that, in skilled hands, can really make a difference.

Publication Types:  
Review

PMID: 14759578 [PubMed - indexed for MEDLINE]

18: Adv Ther. 2001 Sep-Oct;18(5):225-9.

Addition of conjugated linoleic acid to a herbal anticellulite pill.

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This study investigated the effect of a herbal anticellulite pill on visible cellulite in the thighs. Sixty female volunteers took a herbal anticellulite pill or a herbal anticellulite pill plus supplements of conjugated linoleic acid for 60 days. The combination treatment had a beneficial effect in as many as 75% of the women. The appearance of the skin improved significantly, and thigh circumference was reduced by an average of 0.88 inch. Further investigation in a larger, longer placebo-controlled trial is warranted.

Publication Types:  
Clinical Trial  
Randomized Controlled Trial

PMID: 11783459 [PubMed - indexed for MEDLINE]

19: Am J Clin Dermatol. 2000 Nov-Dec;1(6):369-74.

A randomized, placebo-controlled trial of topical retinol in the treatment of cellulite.

Piérard-Franchimont C, Piérard GE, Henry F, Vroome V, Cauwenbergh G.

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**BACKGROUND:** Cellulite occurs to varying degrees on the thighs and buttocks of many otherwise healthy women. Among the many purported treatments for cellulite, only a handful have been tested in clinical trials. **OBJECTIVE:** The aim of this study was to critically explore the reputed effect of topical retinol in the treatment of cellulite. **MATERIALS AND METHODS:** The study compared the effect of topical retinol to a placebo formulation in a left-right randomized trial in order to eliminate the massage-effect. The study was conducted in 15 women aged from 26 to 44 years who had requested liposuction to improve mild to moderate cellulite. **RESULTS:** After 6-months of treatment, skin elasticity was increased by 10.7% while viscosity was decreased by 15.8% at the retinol-treated site. Such an effect on the tensile properties of skin was more prominent where the mattress phenomenon was the only evidence of cellulite. The lumpy-bumpy appearance of the skin showed either little response or was not responsive to the treatment. Although gross microanatomical differences were not disclosed between the comparative sites at completion of the study, evidence for a shift in the phenotype of connective tissue cells was obtained. The main retinol-related change consisted of a 2- to 5-fold increase in the number of factor XIIIa+ dendrocytes both in the dermis and fibrous strands of the hypodermis. **CONCLUSIONS:** We hypothesize that the functional and phenotypic changes seen in this study were linked and represent the result of a direct or indirect modulating effect of retinol on cellulite. Such features ultimately improve the resting tensions inside the skin which should in turn smooth the skin surface.

Publication Types:

Clinical Trial

Randomized Controlled Trial

PMID: 11702613 [PubMed - indexed for MEDLINE]

20: Plast Reconstr Surg. 2001 Jul;108(1):233-40.

Analysis of the effects of deep mechanical massage in the porcine model.

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Deep mechanical massage has been advocated as an alternative or adjunctive therapy for the contouring of subcutaneous fat and as a treatment for cellulite. We evaluated the effects of deep mechanical massage using two pig models. Yucatan pigs were divided into three groups (n = 4). One side of each body received 4, 10, or 20 treatments and the other side served as a control. Full-thickness tissue sections, including the underlying muscle, were harvested from identical treated and untreated regions. Examination of these regionally matched samples revealed an accumulation of dense, longitudinal collagen bands in the middle dermal and deep subdermal regions, which progressively increased with the number of treatments. Distortion and disruption of adipocytes was noted. In Yorkshire pigs, force-transducing balloon catheters were surgically placed between the deep subcutaneous tissue and muscle fascia. Catheters were inserted into two regions with different skin and subcutaneous tissue characteristics, the midflank and the hip. Standardized maneuvers were performed at suction settings 3, 5, 7, and 9 to

record baseline tissue forces. Each maneuver carried a unique force signature. The measurement of tissue forces was repeated on the opposite side after 10 standardized treatment sessions. Analysis showed a significant reduction of measured forces at the midflank after the treatments. The actual force measured with each particular maneuver varied between different operators but not with different suction settings, suggesting that the technique of administering the treatments is the primary factor in creating the force within the tissue. This leads to the conclusion that deep mechanical massage is highly dependent on the individual operator of the device.

Publication Types:

Research Support, Non-U.S. Gov't  
Research Support, U.S. Gov't, P.H.S.

PMID: 11420530 [PubMed - indexed for MEDLINE]

21: Eur J Dermatol. 2000 Dec;10(8):596-603.

Ingredients and safety of cellulite creams.

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There is virtually no knowledge of the ingredients of cellulite creams in the dermatological literature. In the present study, the ingredients of cellulite creams, the frequency of their use and whether the ingredients have been reported to cause allergy were investigated. In the 32 products tested, 263 ingredients were used. On average each product contained 22 ingredients (range 4 to 31). Botanicals and emollients predominated; altogether 44 different botanicals and 39 different emollients were used in the 32 products. Caffeine, present in 14 products was the most common additive, apparently representing an "active" ingredient. In other respects the compositions of the products were similar to those of skin creams. All products contained fragrance. The creams were microbiologically pure. Concentrations of preservatives did not exceed limit values in the regulations. No formaldehyde was present (detection limit 10 ppm). The well-known allergens isothiazolinones or dibromoglutaronitril were declared only in a few products. In spite of the large number of substances used in cellulite creams, their safety seems acceptable for most users. Because, however, one fourth of the substances used have been shown to cause allergy, the risk of adverse effects should be taken into account when using cellulite creams.

PMID: 11125320 [PubMed - indexed for MEDLINE]

22: Plast Reconstr Surg. 1999 Sep;104(4):1110-4; discussion 1115-7.

Cellulite treatment: a myth or reality: a prospective randomized, controlled trial of two therapies, endermologie and aminophylline cream.

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Cellulite is a common phenomenon that particularly affects the thighs and buttocks of women. Little scientific evidence exists to support any of the many advertised treatments for it. A total of 52 of 69 women, who were divided into three groups, completed a 12-week, randomized, controlled trial in which the effectiveness of two different treatments for cellulite was assessed. The patients acted as their own controls. The treatments investigated were twice-daily application of aminophylline cream and twice-weekly treatment with Endermologie ES1. Group 1 (double blind) received aminophylline to one

thigh/buttock and a placebo cream to the other. Group 2 (singly blind) received Endermologie to one thigh/buttock. Group 3 received Endermologie to both sides and used the same cream regimen as group 1. Results were assessed subjectively by the patient and by clinical examination and photographic assessment by the surgeon (before and after the trial). Morphologic assessment included body mass index, thigh girth at two points, and thigh fat depth measurement by ultrasound. No statistical difference existed in measurements between legs for any of the treatment groups (paired t test,  $p > 0.4$ ). The best subjective assessment, by the patients themselves, revealed that only 3 of 35 aminophylline-treated legs and 10 of 35 Endermologie-treated legs had their cellulite appearance improved. The authors do not believe that either of these two treatments is effective in improving the appearance of cellulite.

Publication Types:

Clinical Trial

Randomized Controlled Trial

PMID: 10654755 [PubMed - indexed for MEDLINE]

23: Phytother Res. 1999 Nov;13(7):627-9.

Parallel placebo-controlled clinical study of a mixture of herbs sold as a remedy for cellulite.

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Cellasene, a product containing Ginkgo biloba, sweet clover, sea-weed, grape seed oil, lecithins and evening primrose oil, has been marketed all over the world as a miracle cure for cellulite. As the efficacy of the product was in doubt, a parallel placebo-controlled clinical study was undertaken in a group of women to see whether the product had any effect on cellulite, or on the body weight, fat content, circumference of thighs, hips, etc. No significant changes were found in these parameters compared with the starting values, nor compared with the placebo control after a 2 month course of Cellasene, except for an increase in the cellulite, assessed by the author, compared with that initially. Seven of 11 women taking Cellasene gained weight, as did eight in the placebo control group, taking Colonease, where significance was achieved. The weight gain in both groups was apparent after the first 2 weeks, and all women had to reduce their food consumption. Only three of the women in the Cellasene group thought that their cellulite had slightly improved against two women in the control group. Copyright 1999 John Wiley & Sons, Ltd.

Publication Types:

Clinical Trial

Controlled Clinical Trial

PMID: 10548762 [PubMed - indexed for MEDLINE]

24: Gynecol Endocrinol. 1999 Feb;13(1):1-6.

Gender-specific medicine: the new profile of gynecology.

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The science of gynecology is undergoing a change and is swiftly turning into a holistic discipline, i.e. gender-specific medicine. The rationale for this is that the hormones of the ovary not only are responsible for reproduction but also perform a number of extragenital functions that extend far into other

disciplines, giving rise to a different frequency of diseases in women than in men. For example, females are five times more likely to be affected by rheumatoid arthritis than males, the same also holding true for autoaggressive conditions. This phenomenon may be accounted for by the fact that physiological auto-aggression is involved in the reproductive process. Similarly, there is a difference between women and men with regard to the sicca phenomenon, or to such disorders as connective tissue weakness, cellulite, venous conditions or hypercholesterolemia. A cause-related treatment of such problems is now available through specific endocrine therapy. That is why gynecologists in future will increasingly have to adopt an interdisciplinary approach.

Publication Types:

Review

PMID: 10368792 [PubMed - indexed for MEDLINE]

25: Harv Womens Health Watch. 1999 Jun;6(10):7.

Another cellulite remedy.

[No authors listed]

PMID: 10233809 [PubMed - indexed for MEDLINE]

26: Gastroenterol Clin Biol. 1998 Mar;22(3):360-1.

[Perineal anaerobic necrotizing cellulite after preoperative radiotherapy for rectal cancer]

[Article in French]

Lederman E, Mathieu D, Lescut D, Wattel F, Paris JC.

Publication Types:

Case Reports

Letter

PMID: 9762225 [PubMed - indexed for MEDLINE]

27: Harv Womens Health Watch. 1998 Aug;5(12):7.

Cellulite meltdown?

[No authors listed]

PMID: 9713243 [PubMed - indexed for MEDLINE]

28: Aesthet Surg J. 1998 May - June;18(3):177-182.

Body Contouring: A Preliminary Report on the Use of the Silhouette((R)) Device for Treating Cellulite.

McDaniel DH, Lord J, Ash K, Newman J, Zukowski M.

From the Laser Center of Virginia, (a) Virginia Beach, VA, Eastern Virginia Medical School, Norfolk, VA; the Department of General Surgery, (b) Naval Medical Center Portsmouth, Portsmouth, VA; and the Zukowski Center for Cosmetic Plastic Surgery, (c) Wilmette, IL.

Cellulite is a common condition affecting 85% of postadolescent women. Recent advances in aesthetic techniques have initiated a new pursuit into understanding the cause and treatment of this condition. A recently introduced "roller massage therapy" device, Silhouette((R)), was selected for evaluation in this study.

Three patients were enrolled into this private practice, medical school-affiliated, prospective pilot project. The study objective was to identify whether the Silhouette((R)) device could generate reproducible reductions in the appearance of cellulite or alter body appearance, specifically in the abdominal, buttock, and thigh regions. A secondary goal was to evaluate the effectiveness of various measuring devices used to quantify cellulite regression. These included serial body weights, percent body fat, relative fat distribution, specific anatomic measurements, diagnostic ultrasound, and serial morphed photographic analysis and laboratory data. Initial results showed that 16 biweekly treatments produced minimal changes in body weight or percent body fat. On average, thigh circumferences increased by 1.7 mm and 8.7 mm in the right and left proximal thighs and decreased by 25 mm and 22 mm in the right and left distal thighs, respectively. Diagnostic ultrasound scans showed trends that may provide further insight into a possible mechanism of action. Relative fat distribution values taken from four selected sites proved the most significant finding with selected treatment sites improving on average from 0.8 to 2.1 units (mean 1.5 units/site). This technique provided safe yet modest improvement in the appearance of cellulite. The mechanism of this improvement remains unknown. Further research is needed to determine the mechanism of this improvement, its longevity, optimum treatment parameters, and whether maintenance therapy is needed.

PMID: 19328130 [PubMed - as supplied by publisher]

29: Dermatol Surg. 1997 Dec;23(12):1177-81.

Cellulite. Etiology and purported treatment.

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Much research must be undertaken before any of the treatments discussed can be validated as clinically effective. At present, it can be safely stated that there is no topical medication or manipulative process to which advanced cellulite visibly responds in a treatment period of less than 2 months.

Publication Types:

Review

PMID: 9426662 [PubMed - indexed for MEDLINE]

30: Aesthet Surg J. 1997 Sep-Oct;17(5):304-7.

Prospective and randomized determination of the efficacy of topical lipolytic agents.

Epstein E, Young VL, Schorr M, Young AE, Weisenborn S.

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Numerous manufacturers are marketing topical creams, claiming that they improve or eliminate unwanted fat or cellulite in a short period of time. The active ingredient in most of these creams is theophylline, and claims have been made that it initiates lipolysis by binding to adipocyte beta-adrenergic receptors. The creams are applied with vigorous massage to facilitate absorption and apply mechanical stress to the fat cells. The efficacy of these creams is largely untested. This prospective randomized study was conducted to determine whether there is scientific evidence that application of these creams alone can eliminate unwanted fat or cellulite. Eleven women with normal body weight as defined by insurance tables applied either Skinny Dip(TM) or a placebo to one thigh and one half of the abdomen for 8 weeks. Each subject was examined, photographed, weighed, and measured by a study monitor on a weekly basis. There were no

statistically significant differences in appearance, abdominal circumference, thigh circumference, or skin fold measurements among subjects using the active agent (Skinny Dip(TM)) or the placebo. This study failed to support the efficacy of topically applied lipolytic creams in eliminating unwanted fat manifesting as a localized bulge or cellulite presenting as a dimpling of the skin.

PMID: 19328073 [PubMed - in process]